WHAT IS CLAIMED IS:

1. A heat exchanger panel comprising:

a first panel;

a second panel; and

a fluid containment device sandwiched between said first and second panels, said fluid containment device not being attached to either of said first and second panels.

2. A heat exchanger panel according to claim 1, wherein each of said first and second panels is formed from a high temperature composite material.

3. A heat exchanger panel according to claim 2, wherein said high temperature composite material comprises a carbon/carbon composite material.

4. A heat exchanger panel according to claim 2, wherein said high temperature composite material comprises a carbon/silicon carbide composite material.

5. A heat exchanger panel according to claim 1, wherein said first panel is formed from one of a carbon/carbon composite material and a carbon/silicon carbide composite material and said second panel is formed from one of a carbon/carbon composite material and a carbon/silicon carbide composite material.

6. A heat exchanger panel according to claim 1, further comprising at least one composite fastener for joining said first panel to said second panel.

7. A heat exchanger panel according to claim 6, wherein each said composite fastener comprises a shaft formed from a composite material, said shaft having a first bore, a metal sleeve having an orifice for receiving a portion of said shaft and a second bore extending perpendicular to said orifice, and a locking pin which is inserted into said second bore and said first bore for securing said shaft to said metal sleeve.

8. A heat exchanger panel according to claim 7, further comprising said metal sleeve having an exterior thread and a threaded nut for engaging said exterior thread on said metal sleeve.

9. A heat exchanger panel according to claim 6, wherein said at least one composite fastener further attaches said heat exchange panel to a substructure.

10. A heat exchanger panel according to claim 1, further comprising each of said first and second panels having a surface feature on an interior surface to accommodate said fluid containment device.

11. A heat exchanger panel according to claim 10, wherein said fluid containment device comprises a plurality of tubes and said surface feature on each interior surface comprises a plurality of arched portions.

12. A heat exchanger panel according to claim 10, wherein said fluid containment device comprises two joined metallic sheets formed to create fluid passages and said surface feature on each

interior surface comprises a plurality of arched portions separated by planar portions.

13. A heat exchanger panel according to claim 10, wherein said fluid containment device comprises a metallic heat exchanger with planar face sheets and said surface feature on each interior surface comprises a planar surface feature.

14. A heat exchanger panel comprising:

a first panel formed from a high temperature composite material;

a second panel formed from a high temperature composite material; and

a fluid containment device sandwiched between said first and second panels.

15. A heat exchanger panel according to claim 14, further comprising at least one composite fastener for joining said first panel to said second panel.

16. A heat exchanger panel according to claim 14, wherein said high temperature composite material forming said first and second panels is selected from a group consisting of a carbon/carbon composite material and a carbon/silicon carbide composite material.

17. A wall system for use in a propulsion system, said wall system comprising:

at least one heat exchanger panel;

said at least one heat exchanger panel having an outer panel and an inner panel;

each of said outer and inner panels being formed from a high temperature composite material; and

a coolant containment device sandwiched between said outer and inner panels.

18. A wall system according to claim 17, further comprising said coolant containment device not being fastened to either of said outer and inner panels.

19. A wall system according to claim 17, further comprising a substructure and at least one fastener for securing said outer and inner panels to said substructure.

20. A wall system according to claim 19, wherein each said fastener comprises a composite fastener.

21. A wall system according to claim 19, wherein said at least one fastener has a shaft formed from a non-metallic material and a first bore in said shaft, a metallic sleeve having an orifice for receiving an end portion of said shaft and having a second bore at an angle relative to said orifice, and a locking pin for joining said shaft to said metallic sleeve, said locking pin being inserted into said first and second bores.

22. A wall system according to claim 21, wherein said inner panel and said substructure each have a bore for receiving a portion of said shaft.

Sub A1

23. A wall system according to claim 17, further comprising a plurality of heat exchanger panels and said heat exchanger panels being aligned along a longitudinal axis of said wall system.

24. A wall system according to claim 17, further comprising a leading edge formed from a composite material.

25. A wall system according to claim 19, further comprising means for injecting fuel into a space bounded by said wall system.

26. A wall system according to claim 25, wherein said fuel injecting means comprises a fuel inlet conduit, a manifold connected to said fuel inlet, and a plurality of injection nozzles connected to said manifold.

27. A wall system according to claim 26, wherein said outer panel has an outer surface with a plurality of openings and each of said injection nozzles extends through said openings and above said outer surface.

28. A wall system according to claim 26, wherein said outer panel has an outer surface and a plurality of openings and each of said injection nozzles has an outlet flush with said outer surface and aligned with one of said openings.

29. A wall system according to claim 26, wherein said outer panel has an outer surface and a plurality of openings and each of said injection nozzles extends to a point just below said outer surface and is aligned with one of said openings.

30. A wall system according to claim 17, further comprising said outer and inner panels each extending from a point near a leading edge of said wall system to a point near a trailing edge of said wall system.

31. A wall system according to claim 30, wherein said coolant containment system comprises a plurality of tubular passageways extending parallel to a longitudinal axis of said wall system.

32. A wall system according to claim 17, further comprising an inner panel extending from a point near a leading edge of said wall system to a point near a trailing edge of said wall system and said outer panel comprising a plurality of axially aligned panels.

33. A wall system according to claim 17, wherein said inner panel is a discontinuous panel.

34. A wall system according to claim 17, wherein said inner panel is formed from a plurality of spacers and said coolant containment device comprises a plurality of tubular passages separated by said spacers.

35. A wall system according to claim 17, wherein said propulsion system comprises a scramjet engine.

36. A wall system according to claim 17, wherein said propulsion system comprises a rocket engine.

37. A wall system for use in an air breathing propulsion system comprising:

at least one heat exchanger and a substructure;

said at least one heat exchanger having an outer panel formed from a composite material and a coolant containment device bounded by said outer panel; and

means for fastening said outer panel to said substructure.

38. A wall system according to claim 37, wherein said coolant containment device comprises a plurality of tubular passageways and said heat exchanger further comprises a plurality of spacers between said tubular passageways.

39. A wall system according to claim 37, further comprising means for injecting fuel into a space bounded by said wall system.

40. A wall system according to claim 37, wherein said composite material is selected from the group consisting of a carbon/carbon composite material and a carbon/silicon carbide composite material.